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(54) Processorsystem comprising a processor and a memory field for containing a computer interface.

(57) Known processorsystems comprising a processor and memory fields for containing human computer interfaces each having a number of elements each representing a function are little flexible systems. The processorsystem according to the invention is a very flexible system, by receiving a user code and generating an adjustable code which is allocated to an element and which depends upon the user code. This adjustable code can be a transmissioncode representing transmission information or can be a displaycode like an elementcode representing a displayelement being enabled or disabled or an elementparameter representing a number of times a displayelement has been activated.

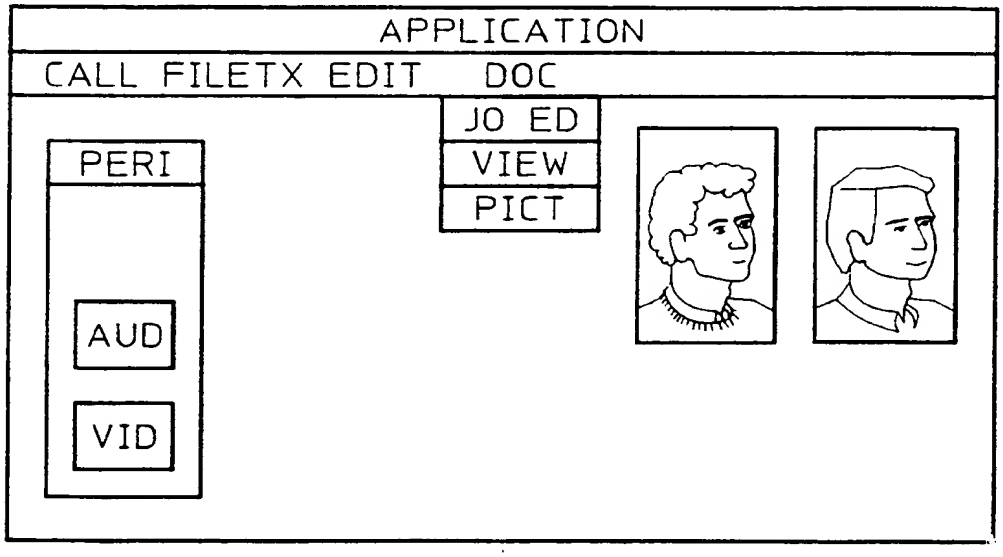

Fig. 5B

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A Background of the invention

The invention relates to a processorsystem comprising a processor and a memory field for containing a computer interface having a number of elements each representing a function, the processorsystem being adapted for displaying at least one element on a screen.

Such processorsystems are of common general knowledge, for example a Personal Computer (PC) or a workstation. The computer interface has a number of elements each representing a function, for example an icon (function: for example file transfer), a menubar (function: for example menu item choise), a window (function: for example editing of text or sharing computer application data), a videowindow (function: for example display of image) or a number of required videowindows (function: for example required number of images to be displayed simultaneously). The processorsystem is adapted for displaying one or more elements directly on a screen, like four icons, one menubar including menu-items and two videowindows, and for displaying other elements indirectly on the screen, like two other icons and a pull-down-menu-item (these can be displayed for example by selecting a menu-item on the displayed menubar). Other elements are never displayed on the screen, like the number of required videowindows.

These known processorsystems are little flexible systems, which is disadvantageous.

B Summary of the invention

It is an object of the invention, inter alia, to provide a more flexible processorsystem as defined by the preamble.

Thereto, the processorsystem according to the invention is characterised in that the processorsystem is adapted for

- receiving a user code from a user, and
- generating at least one adjustable code in dependence of the user code, the adjustable code being allocated to an element.

A user code is sent by a user to the processorsystem, for example via a password or a smart card. In dependence of this user code an adjustable code is generated, for example by selecting a part of the user code or by converting a part of the user code and defining this converted part as being the adjustable code, or by using the part of the user code for addressing a processormemory and reading out the adjustable code. This adjustable code is allocated to an element, which then becomes a user-dependent element. For example, for a first user an icon is displayed directly while for a second user the same icon is displayed indirectly. So, a very flexible processorsystem is created by making elements user-dependent, and the adjustability of the adjustable code allows a user to change the user-dependent element.

This invention is based on a first insight that all present processorsystems comprising a processor and a memory field for containing a computer interface are little flexible systems as a consequence of the fact that the elements of the computer interface are not chosen differently for each user, and that at the hand of the received user code an adjustable code can be generated which is allocated to an element to supply this element of user-dependent information.

A first embodiment of this invention is characterised in that the processorsystem comprises a further memory field for containing a further computer interface having a further number of elements each representing a function, the processorsystem being adapted for selecting one of the memory fields in dependence of the user code.

By selecting between a memory containing a computer interface belonging to a user or a class of users and a memory containing a further computer interface belonging to a further user or a further class of users a user can choose which computer interface he prefers at the hand of the user code.

A second embodiment of this invention is characterised in that the adjustable code comprises a transmissioncode being allocated to a transmissionelement representing a transmissionfunction.

Such a transmissionelement is for example a required bitrate for transmission.

A third embodiment of this invention is characterised in that the processorsystem is adapted for storing a new value of the transmissioncode at a memory location which is associated with the user code.

By storing a new value of a transmissioncode a user, after the application to which the computer interface belongs being switched off and on, gets a computer interface according to the latest status.

A fourth embodiment of this invention is characterised in that the adjustable code comprises a displaycode being allocated to a displayelement representing a displayfunction, this displaycode being an elementcode representing this displayelement being enabled or disabled, the processorsystem being adapted for displaying or not displaying this displayelement on a screen in dependence of the elementcode.

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A user being allowed to activate enabled elements only cannot activate disabled elements. These are not displayed or displayed in an other way showing the disablement.

A fifth embodiment of this invention is characterised in that the processorsystem is adapted for storing a new value of the elementcode at a memory location which is associated with the user code.

By storing a new value of an elementcode a user, after the application to which the computer interface belongs being switched off and on, gets a computer interface according to the latest status.

A sixth embodiment of this invention is characterised in that the adjustable code comprises a displaycode being allocated to a displayelement representing a displayfunction, this displaycode being an elementparameter being a function of a number of times that this displayelement has been activated, the processorsystem being adapted for comparing this elementparameter with a predefined value and in dependence of a comparisonresult directly or indirectly displaying this displayelement on a screen.

Such a processorsystem is flexible as well as dynamic, the number of times a displayelelement has been activated determining whether this displayelement is displayed directly or indirectly.

A seventh embodiment of this invention is characterised in that the processorsystem is adapted for storing a new value of the elementparameter at a memory location which is associated with the user code.

By storing a new value of an elementparameter a user, after the application to which the computer interface belongs being switched off and on, gets a computer interface according to the latest status.

Of course, two or more of the mentioned embodiments can be combined in all possible ways.

C Reference

none

D Embodiment of the invention

The invention will be explained in detail at the hand of embodiments shown in the figures:

Figure 1 shows a processorsystem according to the invention comprising four memory fields for containing computer interfaces.

Figure 2 shows a representation of the four memory fields each one of them comprising an elementcode and elementparameters belonging to an element of a computer interface.

Figure 3 shows possible embodiments of user codes in figure 3a, 3b and 3c for a processorsystem according to the invention.

Figure 4 shows a flow chart of adapting an adaptable computer interface in an adaptable memory field.

Figure 5 shows three possible screenlayouts in figure 5a, 5b and 5c for a processorsystem according to the invention.

In figure 1 processorsystem 10 comprises a processor 11, an interpreter 12, four memory fields X, Y, Z and W. Via a bus 13 processor 11 is connected with interpreter 12 and with the memory fields X, Y, Z and W, and via a bus 14 memory fields X, Y, Z and W are connected with interpreter 12. Processorsystem 10 further comprises a receiver 15 for receiving a user code 17, which receiver 15 is coupled via a bus 16 with processor 11. Receiver 15 could be a keyboard, in which case user code 17 is a password, or could be a smart card reader, in which case user code 17 is stored on a smart card. A memory field X, Y, Z or W contains a computer interface having according to this embodiment seven elements A, B, C, D, E, F and G, each one of these elements representing a different function. At least one of them is a displayelement and can be displayed directly on a screen, for example an icon which is activated by a mouse. Other displayelements can only be displayed indirectly, for example via a menu-item on a displayed menubar via which these displayelements are to be selected using a mouse. Further elements cannot be displayed at all, for example transmissionelements.

In figure 2 four memory fields X, Y, Z and W are represented. A computer interface comprises according to this embodiment seven elements, six displayelements A (row i = 1), B (row i = 2), C (row i = 3), D (row i = 4), E (row i = 5) and F (row i = 6) and one transmissionelement G. To each displayelement A, B, C, D, E or F an elementcode (column k) and three elementparameters (columns l, m and n) are allocated. An elementcode $X_{i,k}$, $Y_{i,k}$, $Z_{i,k}$ and $W_{i,k}$ represents this displayelement being enabled or disabled, and an elementparameter $X_{i,l}$, $Y_{i,l}$, $Z_{i,l}$ and $W_{i,l}$ represents this displayelement being displayed directly or indirectly. An elementparameter $X_{i,m}$, $Y_{i,m}$, $Z_{i,m}$ and $W_{i,m}$ represents a number of times for example per timeinterval this displayelement has been activated, and an elementparameter $X_{i,n}$, $Y_{i,n}$, $Z_{i,n}$ and $W_{i,n}$ represents a previous number of times for example per timeinterval this displayelement has been activated. Of course, further elementcodes and elementparameters are possible. In dependence of a received user code, at least one adjustable code is generated, which is allocated to an element. This adjustable code could be the

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elementcode, one of the elementparameters, or a combination of one or more of the elementparameters and the elementcode. According to another embodiment this adjustable code represents the elementcode, one of the elementparameters, or a combination of one or more of the elementparameters and the elementcode, for example by being an adjustable pointer for a memory in which elementcodes and elementparameters are stored.

In figure 3a, user code 20 comprises an identificationsection 21 for identifying a user and/or defining a usercluster, five sections with respect to element A and its elementcode and elementparameters, five sections with respect to element B and its elementcode and elementparameters, etc. Each section comprises a number of bits or one or more bytes, for example. Such a user code 20 could be stored on a smartcard or somewhere else or could be derived from a password.

In figure 3b, all sections of user code 20 apart from identificationsection 21 are stored in part of processormemory 28, which is addressed at the hand of user code 22, which comprises identificationsection 21 and addresssection 23. Such a user code 22 could be stored on a smart card or somwhere else or could be derived from a password. In fact, the smallest possible user code only comprises an addresssection.

In figure 3c, user code 24 comprises identificationsection 21 and six sections with respect to amendments which are to be made to for example a memory field, associated with the user code, comprising elementcodes and/or elementparameters. According to this embodiment, an amendment is to be made to an elementcode and/or elementparameters of element B at the hand of section 25, an amendment is to be made to an elementcode and/or elementparameters of element D at the hand of section 26 and an amendment is to be made to a function of element G at the hand of section 27. Such a user code 24 could be stored on a smart card or somewhere else or could be derived from a password. It is further possible according to another user code to store the six sections in another processormemory adapted for storing (in association with the other user code) amendments only and to address this other processormemory at the hand of this other user code.

A user code can also be more complicated like an executable file for example a user profile.

After adaptation or adjustment new values of transmissioncodes, elementcodes and/or elementparameters and/or amendments only can be stored at a memory location, for example on a smart card (in which case they are automatically associated with the user code), or in a part of processormemory 28 or another processormemory adapted for storing amendments only (in which cases their location in these memories should be associated to the user code).

In figure 4 blocks of the flow chart have the following meaning:

block	meaning
40	start
41	calculate predefined value as threshold value for only those elements which are enabled and subject to adaptation
42	i:= 1
43	$W_{i,m} \geq$ threshold value ? if yes: to block 45 if no : to block 44
44	$W_{i,l}$: = Indirect
45	$W_{i,l}$: = Direct
46	i : = i + 1
47	i = 7 ? if yes : to block 48 if no : to block 43
48	stop

According to the flow chart of figure 4, after the adapting has started (block 40), a predefined value further to be called threshold value is calculated (block 41), but only for those elements which are enabled and subject to adaptation (transmissionelement G in figure 2 is not to be adapted). There are several possibilities to do this, for example:

- comparing the number of times an enabled element has been activated with the number of times another enabled element has been activated for each possible combination of enabled elements, and

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at the hand of the comparisonresults selecting a certain borderline as a threshold;

- calculating an average of several previous numbers of times enabled elements have been activated and selecting the average as a threshold;
- adding an element-dependent number to a previous number of times an enabled element has been activated and selecting the sum as an elementdependent threshold;
- calculating an average of a present and one or more previous thresholds.

Then i gets the value 1 (block 42) and the number of times an element has been activated $W_{i,m}$ is compared with the calculated threshold (block 43), which causes this element to be displayed directly (block 45) or indirectly (block 44). Subsequently, i is increased by the value 1 (block 46) and the next number of times an element has been activated is compared with the calculated threshold (block 43 etc.) until i gets the value 7 (block 47). Of all six elements $W_{i,l}$ has been determined, and the adapting stops (block 48).

While some thresholds, like the one being a selected borderline, will lead to a number of elements to be displayed directly being equal to a maximum number of elements that can be displayed directly, other thresholds, like the one being a sum of an element-dependent number and a previous number, could lead to a larger or smaller number than the maximum number. In case of a larger number, a next selection should be made to decrease the larger number, for example at the hand of a new borderline which is defined for elements belonging to the larger number only. In case of a smaller number, this should be increased, for example at the hand of a new borderline which is defined for only those elements not belonging to the smaller number.

To adapt a computer interface, there are several possibilities:

- the content of a memory field X, Y, Z or W remains in the same memory field while adapting;
- the content of a memory field X, Y or Z is placed into the memory field W for the adapting;
- the content of a memory field X, Y, Z or W is placed into another memory not shown in figure 1, for example a processormemory, for the adapting.

The screenlayout of a conference application in figure 5a belonging to a first user having a first user code shows a directly displayed element "window" containing a directly displayed element "menubar" comprising elements "menu-items" like CALL (set up connection), FILETX (select & transmit file), PICT (select, view & transmit selected picture) and DOC (local editing & view selected document), which all are also displayed directly. Further an element "window" PERI (select peripheral) is shown comprising a directly displayed element "icon" AUD (select audio) and a directly displayed element "icon" VID (select video). The element "menu-item" DOC has been activated, and its pull down menu is shown comprising "pull-down-menu-items" EDIT (local editing selected document) and VIEW (view selected document). Since the elements "pull-down-menu-item" are displayed only after activation of element "menu-item" DOC, these elements are displayed indirectly. The other elements "menu-item" CALL, FILETX and PICT are not activated, but could also be activated. The elements "icon" AUD and VID are not activated, but could be activated. If for example the element "icon" AUD would have been activated, as a result an element "window" AUDIO would have been shown comprising elements "icon" loudspeaker, AUD MU (audio muting) and QU (quit for closing element "window" AUDIO). Since the element "window" AUDIO will be displayed only after activation of the element "icon" AUD, the element "window" AUDIO (and its elements "icon") is displayed indirectly. Two further elements "videowindows" showing other conferees are also directly displayed in this screenlayout.

The screenlayout of a conference application in figure 5b belonging to a second user having a second user code shows a directly displayed element "window" containing a directly displayed element "menubar" comprising elements "menu-items" like CALL (set up connection), FILETX (select & transmit file), EDIT (local editing) and DOC (joint editing & view selected document & select, view and transmit selected picture), which all are also displayed directly. Further an element "window" PERI (select peripheral) is shown comprising a directly displayed element "icon" AUD (select audio) and a directly displayed element "icon" VID (select video). Element "menu-item" DOC has been activated, and its pull down menu is shown comprising "pull-down-menu-items" JO ED (joint editing selected document), VIEW (view selected document) and PICT (select, view & transmit selected picture). Since the elements "pull-down-menu-item" are displayed only after activation of the element "menu-item" DOC, these elements are displayed indirectly. The other elements "menu-item" CALL, FILETX and EDIT are not activated, but could also be activated. The elements "icon" AUD and VID are not activated, but could be activated. If for example the element "icon" AUD would have been activated, as a result an element "window" AUDIO would have been shown comprising elements "icon" loudspeaker, AUD MU (audio muting) and QU (quit for closing element "window" AUDIO). Since the element "window" AUDIO will be displayed only after activation of the element "icon" AUD, the element "window" AUDIO (and its elements "icon") is displayed indirectly. Two further

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elements "videowindows" showing other conferees are also directly displayed in this screenlayout.

The screenlayout of a conference application in figure 5c belonging to a third user having a third user code shows a directly displayed element "window" containing a directly displayed element "menubar" comprising elements "menu-items" like CALL (set up connection), FILETX (select & transmit file) and ENCRYPT (encryption of selected file), which all are also displayed directly. Further an element "window" PERI (select peripheral) is shown comprising a directly displayed element "icon" AUD (select audio), a directly displayed element "icon" VID (select video) and a directly displayed element "icon" AUD MU (audio muting). The elements "menu-item" CALL, FILETX and ENCRYPT are not activated, but could be activated. The elements "icon" AUD and VID are not activated, but could also be activated. If for example the element "icon" AUD would have been activated, as a result an element "window" AUDIO would have been shown comprising elements "icon" loudspeaker and QU (quit for closing element "window" AUDIO). Since the element "window" AUDIO will be displayed only after activation of the element "icon" AUD, the element "window" AUDIO (and its elements "icon") is displayed indirectly. Three further elements "videowindows" showing other conferees are also directly displayed in this screenlayout.

For each one of the three users the elements "menu-item" CALL and FILETX are displayed directly, which means they can be activated immediately. For the first and second user the element "menu-item" DOC is displayed directly and has been activated by them: the first user gets the elements "pull-down-menu-item" EDIT and VIEW, while the second user gets the elements "pull-down-menu-item" JO ED, VIEW and PICT. For the third user the element "menu-item" ENCRYPT is displayed directly, which means that it can be activated directly. This element "menu-item" ENCRYPT is not enabled for the other two users.

For the first and second user the element "window" PERI is shown comprising a directly displayed element "icon" AUD and a directly displayed element "icon" VID, which can be activated immediately. The element "window" PERI belonging to the third user comprises a directly displayed element "icon" AUD and a directly displayed element "icon" VID as well as a directly displayed element "icon" AUD MU, which all can be activated immediately.

For the first and second user only two elements "videowindows" showing other conferees are directly displayed, while for the third user three elements "videowindows" showing other conferees are directly displayed.

Summarising, because of the different user codes the third user gets three elements "videowindows", while the first and second user only get two elements "videowindows". So the third user can see three other conferees, while the first and second user can see two other conferees. Only the third user gets the element "menu-item" ENCRYPT, while only the first and second user get the element "menu-item" DOC. So only the third user can encrypt his files, and only the first and second user can edit documents. Both first and second user get the element "pull-down-menu-item" VIEW to view documents via a pull-down-menu, while only the first user gets the element "pull-down-menu-item" EDIT and only the second user gets the elements "pull-down-menu-item" JO ED and PICT. So the first user can edit his document locally via a pull-down-menu, but not jointly, while the second user can edit his document jointly with others and select, view and transmit pictures via a pull-down-menu. The element "menu-item" PICT is displayed directly for the first user only, whereas the elements "menu-item" EDIT is displayed directly for the second user only. So the first user can select, view and transmit pictures immediately, while the second user can edit documents immediately. All users get the elements "icon" AUD and VID and can therefore select audio and video immediately, while only the third user gets the element "icon" AUD MU, so only he can mute the audiosignal immediately, the other two users can do this after activation of the element "icon" AUD.

According to figure 2 and figure 5a, the elementcodes and elementparameters allocated to the displayelements could be as follows (transmissionelements are not included in this table):

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element	k	l	m	n
menubar	E	D	-	-
CALL	E	D	7	8
FILETX	E	D	6	9
PICT	E	D	4	5
DOC	E	D	4	6
EDIT	E	I	3	4
JO ED	D	I	-	-
VIEW	E	I	1	2
PERI	E	D	-	-
AUD	E	D	6	3
VID	E	D	5	4
AUD MU	E	I	2	3
loudspeaker	E	I	1	1

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QU	E	I	-	-
number of required videowindows	E	D	-	-

According to this table all elements but the element "pull-down-menu-item" JO ED are enabled (column k), which means that they are displayed either directly or indirectly (column 1). The element "pull-down-menu-item" JO ED is disabled and therefore not shown at all or according to another embodiment shown together with an indication showing the disablement. Further, the number of times (column m) they have been activated, for example during an hour, and the previous number of times (column n) they have been activated, for example during a previous hour, is shown, except for the elements menubar and PERI, which are always shown directly, and except for the element JO ED which is disabled.

As can be derived from column m, the directly displayed element "menu-item" PICT (E,D,4,5) has been activated 4 times per timeinterval and the indirectly displayed element "pull-down-menu-item" EDIT (E,I,3,4) has been activated 3 times per timeinterval. If during a next timeinterval the element PERI is activated 4 times and the element EDIT is activated 5 times, then the element PERI will be displayed indirectly (as a pull-down-menu-item element: E,I,4,4) and the element EDIT will be displayed directly (as a menu-item element: E,D,5,3).

As can be derived from column m, the indirectly displayed element "icon" AUD MU (E,I,2,3) has been activated 2 times per timeinterval, which number of times is smaller than a certain threshold, for example 4 times per timeinterval. If during a next timeinterval the element AUD MU is activated 5 times, which number of times is larger than the certain threshold of 4 times per timeinterval, then the element AUD MU will be displayed directly (as a directly displayed element "icon": E,D,5,2).

Of course, measures should be taken to allocate an elementtype ("menubar", "menu-item", "pull-down-menu-item", "window", "icon" etc.) to each element in the table. This could be realised by allocating a certain elementtype to each row of the shown table (for example the first row always being a "menubar" row, the second and third row always being "menu-item" rows, etc.), in which case sometimes it will be necessary to interchange some elements after adaptation. It could also be realised by adding an extra column to the shown table for indicating the elementtype.

For transmissionelements it may be necessary to define other columns, comprising transmissioncodes, in the table, for example for the transmissionelement "bitrate" : the transmissioncodes "enabled/disabled" and value "64000" meaning an allowed transmission bitrate of 64 kbit/sec.

The entire content of the table could be stored on a smart card of the first user being a part of the first user code (in which case a memory field is filled with this content during activation of the application), or could be stored in a processormemory (figure 3b) which is addressable at the hand of the first user code, or could be stored in a memory field (figure 2) which is selectable at the hand of the first user code. It is also possible that a basiccontent is stored in a memory field (which is selectable at the hand of the first user code) or a processormemory (which is addressable at the hand of the first user code) and that an amendmentcontent (which together with the basiccontent forms the content of the table) is stored on the smart card or in another memory field (which is selectable at the hand of the first user code) or in another (processor)memory (which is addressable at the hand of the first user code).

According to figure 2 and figure 5b, and figure 2 and figure 5c other tables comprising other contents will be definable for the second and the third user.

Claims

1. Processorsystem comprising a processor and a memory field for containing a computer interface having a number of elements each representing a function, the processorsystem being adapted for displaying at least one element on a screen, characterised in that the processorsystem is adapted for
   - receiving a user code from a user, and
   - generating at least one adjustable code in dependence of the user code, the adjustable code being allocated to an element.

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2. Processorsystem according to claim 1, characterised in that the processorsystem comprises a further memory field for containing a further computer interface having a further number of elements each representing a function, the processorsystem being adapted for selecting one of the memory fields in dependence of the user code.

3. Processorsystem according to claim 1 or 2, characterised in that the adjustable code comprises a transmissioncode being allocated to a transmissionelement representing a transmissionfunction.

4. Processorsystem according to claim 3, characterised in that the processorsystem is adapted for storing a new value of the transmissioncode at a memory location which is associated with the user code.

5. Processorsystem according to claim 1 or 2, characterised in that the adjustable code comprises a displaycode being allocated to a displayelement representing a displayfunction, this displaycode being an elementcode representing this displayelement being enabled or disabled, the processorsystem being adapted for displaying or not displaying this displayelement on a screen in dependence of the elementcode.

6. Processorsystem according to claim 5, characterised in that the processorsystem is adapted for storing a new value of the elementcode at a memory location which is associated with the user code.

7. Processorsystem according to claim 1 or 2, characterised in that the adjustable code comprises a displaycode being allocated to a displayelement representing a displayfunction, this displaycode being an elementparameter being a function of a number of times that this displayelement has been activated, the processorsystem being adapted for comparing this elementparameter with a predefined value and in dependence of a comparisonresult directly or indirectly displaying this displayelement on a screen.

8. Processorsystem according to claim 7, characterised in that the processorsystem is adapted for storing a new value of the elementparameter at a memory location which is associated with the user code.

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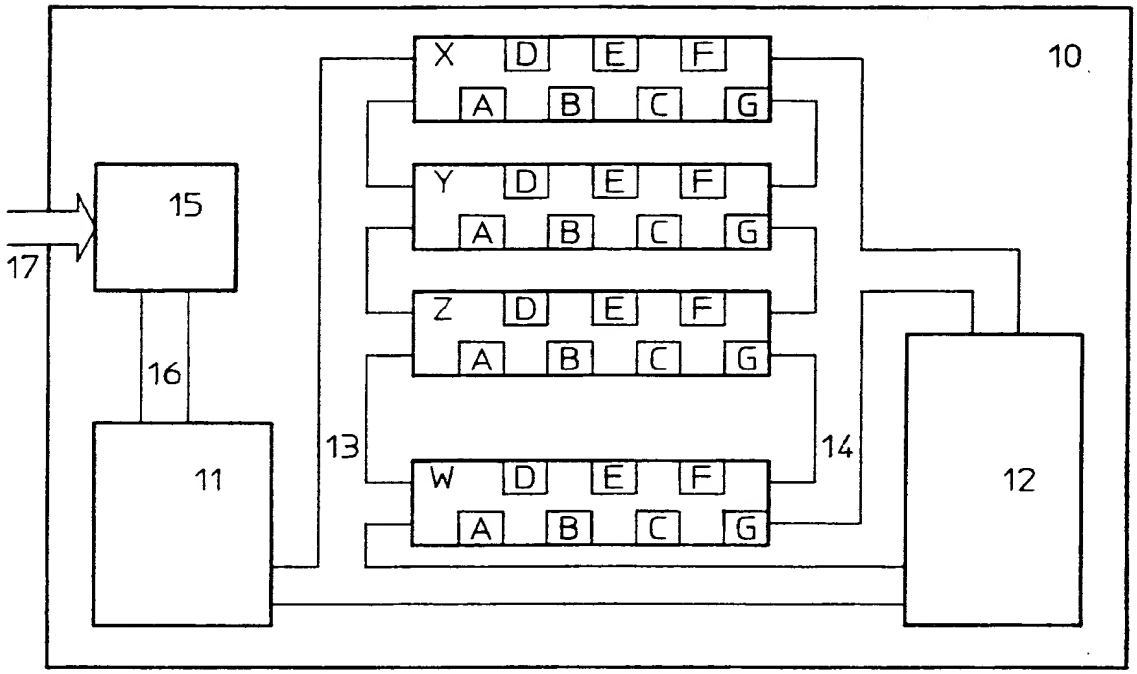

Fig. 1

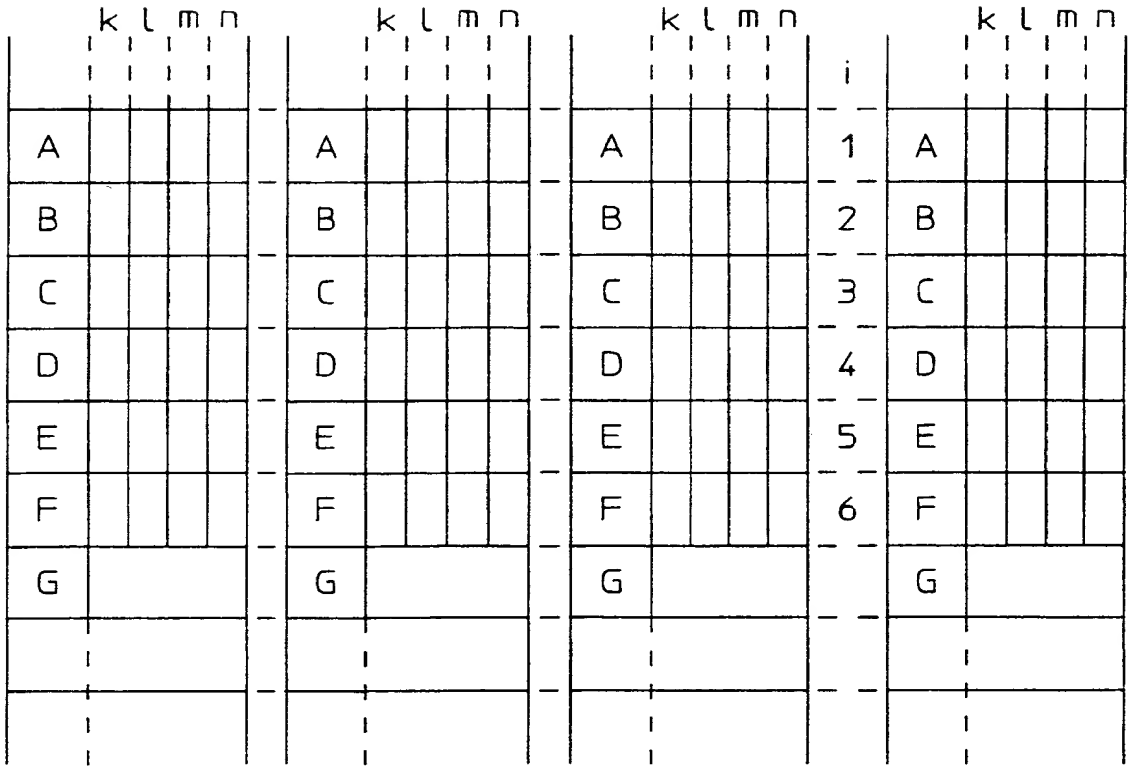

Fig. 2

Fig. 3A

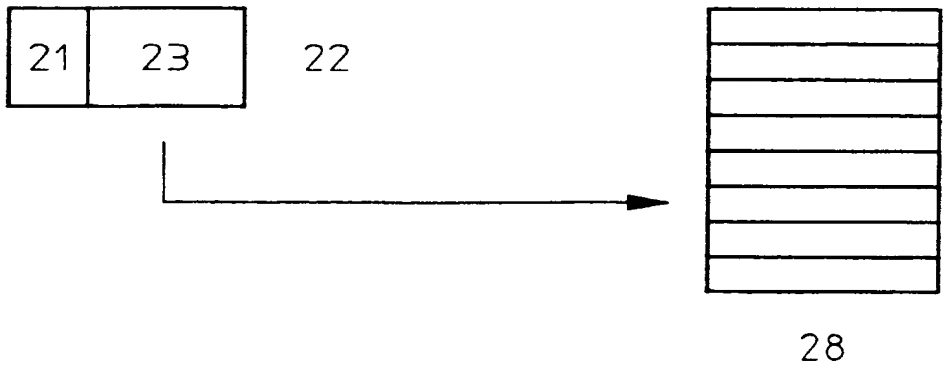

Fig. 3B

Fig. 3C

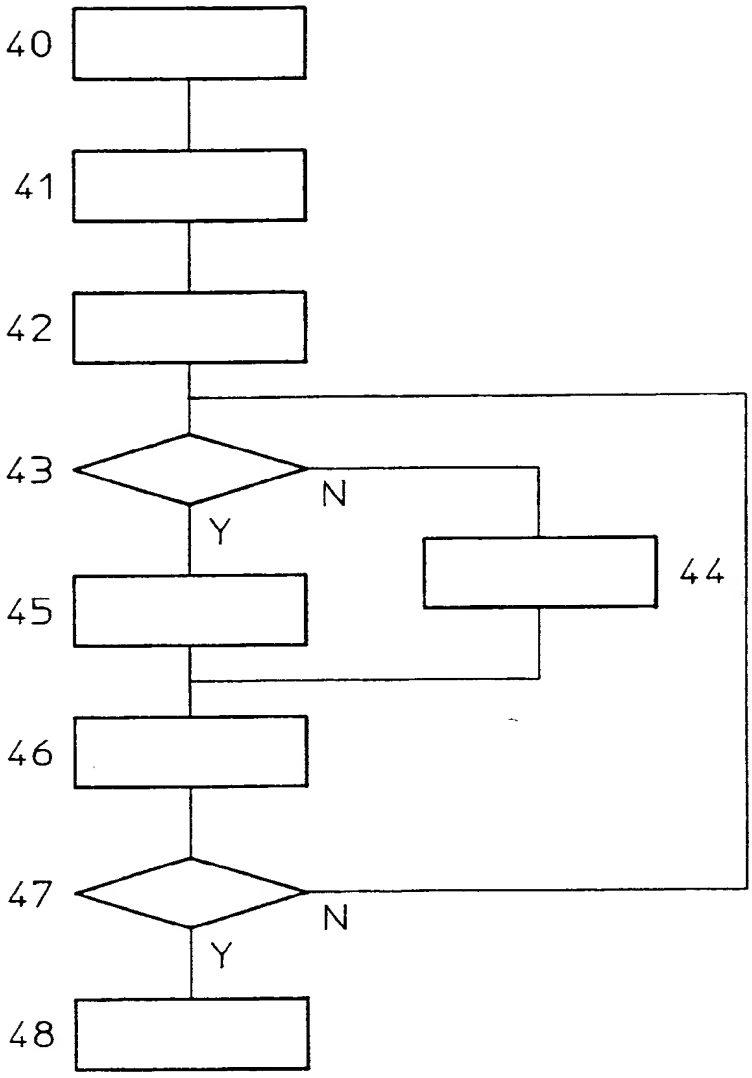

Fig. 4

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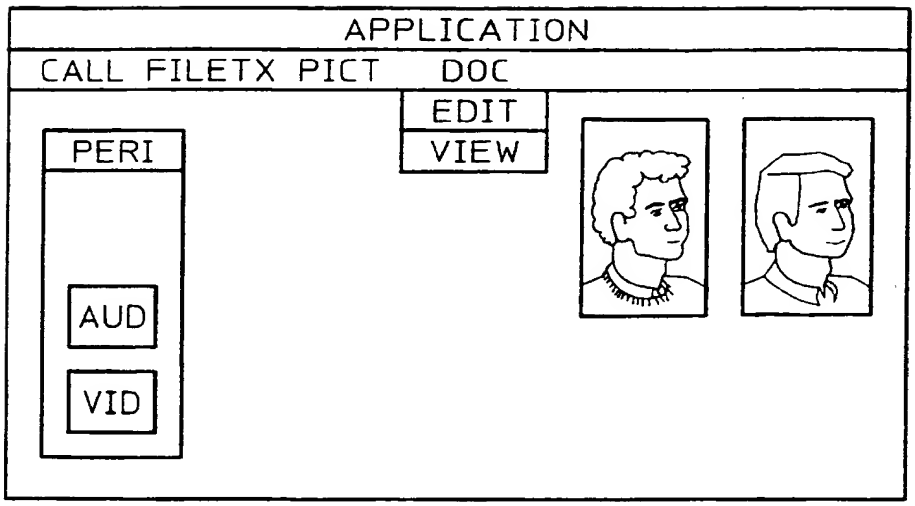

Fig. 5A

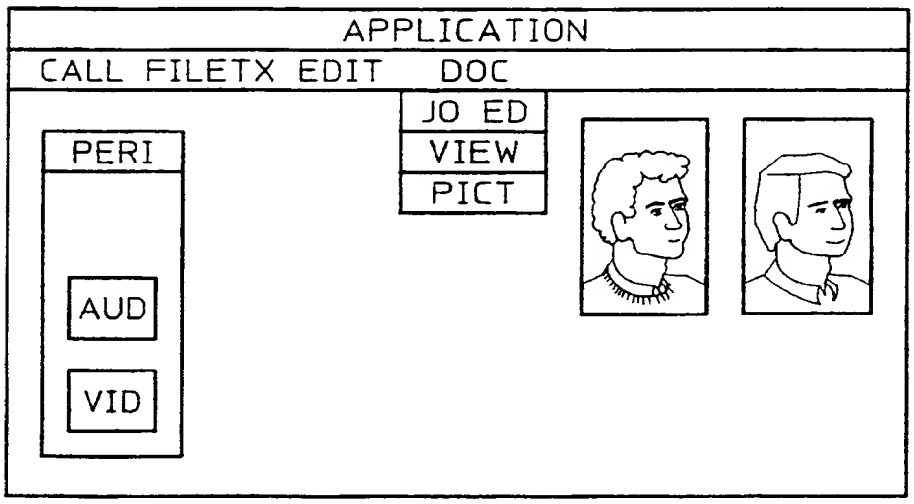

Fig. 5B

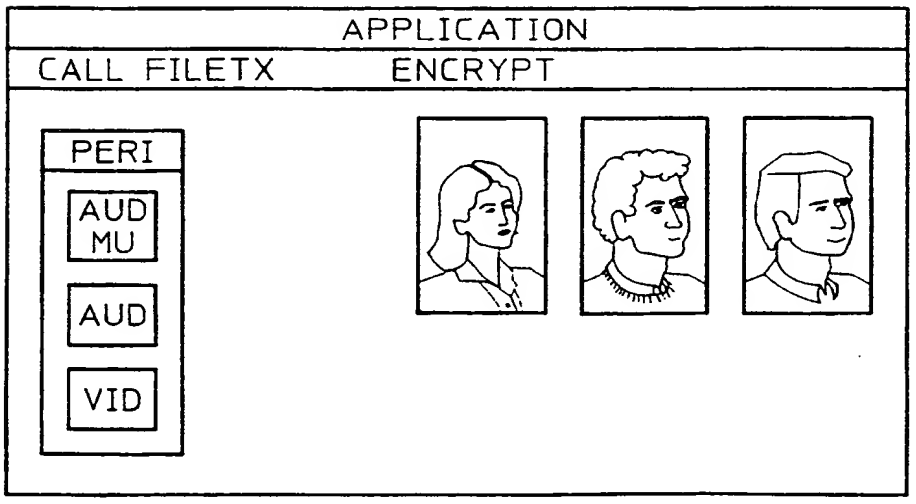

Fig. 5C

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 2011

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	PROCEEDINGS OF THE ACM SYMPOSIUM ON UIST, N HEAD, SOUTH CAR., USA, NOV. 11-13,1991,P 79-86 E.A. BIER ET AL., : "MMM: A USER INTERFACE	1-3,5,6	G06F3/033 G06F1/00
A	* figures 1-7 * * page 79, left column, line 1 - right column, line 26 * * page 80, right column, line 27 - page 82, right column, line 48 *	7,8	
Y A	EP-A-0 464 306 (IBM) * figures 2,4-10 * * column 7, line 31 - column 10, line 7 * * column 14, line 43 - column 15, line 25 * * column 16, line 24 - line 34 *	1-3,5,6 7,8	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
G06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 December 1993	Weiss, P

CATEGORY OF CITED DOCUMENTS

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